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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/661,040

09/12/2003

Ang Meng Liang

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George O. Saile & Associates
28 Davis Avenue
Poughkeepsie, NY 12603

EXAMINER

STAICOVICI, STEFAN

ART UNIT

PAPER NUMBER

1732

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/12/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/661,040

Applicant(s)

LIANG ET AL.

Examiner

Stefan Staicovici

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicants' amendment filed January 8, 2007 has been entered. Claims 1-19 are pending in the instant application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freeman (US Patent No. 4,863,771) in view of Robin *et al.* (US Patent No. 3,892,831) and in further view of Mittelstadt *et al.* (US Patent No. 4,475,976), Azzani *et al.* (US Patent No. 5,013,514) and Nelson *et al.* (US Patent No. 6,143,236).

Freeman ('771) teaches the basic claimed process for making a tubular composite door including, providing a mold having a lower mold half (24) and an upper mold half (36) and a plurality of corners (see the corners Figure 1), placing fiber material (38) onto said lower and upper mold halves, placing an inflatable plastic bladder (40) (plastic tube) onto said fiber material (38), closing said lower and upper mold halves, pressurizing said inflatable plastic bladder (40) (plastic tube) to force said fiber material (38) against said lower and upper mold halves, injecting resin material into said mold to impregnate said fiber material (38) and curing

said resin under conditions of pressure and temperature to form said tubular composite door (see col. 2, lines 31 through col. 3, line 10). Further, Freeman ('771) teaches forming said inflatable plastic bladder (40) (plastic tube) from a plurality of bladders (plastic tubes) when making a jointed structure (10) (see Figure 1) or forming a single, complex shaped inflatable plastic bladder (see col. 3, lines 20-30).

Regarding claims 1 and 8, Freeman ('771) does not teach pre-impregnated fiber material. However, it is known that resin injection and pre-impregnation are well known equivalent alternatives as evidenced by Robin *et al.* ('831) who teach a molding process including, providing a mold, placing fiber material around an inflatable, nylon sheath (4) to form a wrapped assembly, placing said wrapped assembly in said mold, inflating said sheath to press said fiber material against said mold and curing said resin that was either injected or pre-impregnated (see Abstract, col. 3, lines 40-55 and Figure 1-4) in said mold to form a fiber composite structure. Therefore, it would have been obvious for one of ordinary skill in the art to have used a resin pre-impregnation step as an equivalent alternative to a resin injection step as taught by Robin *et al.* ('831) in the process of Freeman ('771) because, Robin *et al.* ('831) specifically teach that resin injection and resin pre-impregnation are well known equivalent alternatives for applying a resin material to a fiber material in order to mold a fiber composite structure.

Further regarding claims 1 and 8, although Freeman ('771) teaches an inflatable plastic bladder (40), Freeman ('771) does not teach that said plastic is nylon. However, the use of nylon to make an inflatable bladder is well known as evidenced by Robin *et al.* ('831) as shown above (see Abstract, col. 3, lines 40-55 and Figure 1-4). Therefore, it would have been obvious for one

of ordinary skill in the art to have provided an inflatable nylon bladder as taught by Robin *et al.* ('831) in the process of Freeman ('771) because, Robin *et al.* ('831) teach that nylon is an optimum material for such a bladder, hence teaching that it is a known material for such applications, and also because it is known that nylon is easily stretchable and has resistance to heat during the curing step, hence providing for an improved process by reducing waste. Furthermore, Freeman ('771) teaches an inflatable plastic bladder, hence suggesting the nylon material of Robin *et al.* ('831).

Further regarding claims 1 and 8, although Freeman ('771) in view of Robin *et al.* ('831) teaches applying fibrous material "manually" (see col. 2, lines 23-26 of Freeman ('771)), Freeman ('771) in view of Robin *et al.* ('831) do not teach compacting each composite layer by applying a vacuum. However, the use of vacuum to compact individual layers is notoriously well known as evidenced by Mittelstadt *et al.* ('976) who teach that it is conventional when building a fiber-reinforced composite to apply a plastic film and then vacuum each individual layer prior to applying an additional fiber composite layer (see col. 1, lines 23-44). Therefore, it would have been obvious for one of ordinary skill in the art to employ vacuum debulking as taught by Mittelstadt *et al.* ('976) in the process of Freeman ('771) in view of Robin *et al.* ('831) because of known advantages such as reduced porosity, hence providing for an improved product and also because Freeman ('771) in view of Robin *et al.* ('831) teach manual debulking, hence suggesting the vacuum debulking process of Mittelstadt *et al.* ('976).

Further regarding claims 1 and 8, Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976) do not each an external vacuum bag. Azzani *et al.* ('514)

teach a molding process including, providing a mold (11, 12), placing fiber material around an inflatable bag to form a wrapped assembly, placing said wrapped assembly in said mold, wrapping said mold in an external vacuum bag and sealing said external bag against said inflatable bag, drawing a vacuum onto said external vacuum bag, placing said vacuum, wrapped mold in an autoclave, inflating said inflatable bag using the pressure of the autoclave to force said fiber material against said mold and curing said resin to form a fiber composite structure (see col. 4, line 47 through col. 5, line 5; col. 5, line 63 through col. 6, line 20 and Figure 16). Therefore, it would have been obvious for one of ordinary skill in the art to have used sealed an external vacuum against an internal inflatable bladder as taught by Azzani *et al.* ('514) in the process of Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976) because of known advantages that vacuum curing provides such as reduced porosity and thereby improved mechanical characteristics, hence providing for an improved product.

Further regarding claims 1 and 8, although Freeman ('771) specifically teaches the ability to remove the inflatable plastic bladder (40) (plastic tube) from the resulting molded structure (see col. 3, lines 6-10), Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976) and Azzani *et al.* ('514) do not teach pulling out the inflatable nylon bladder. However, removing an inflatable bladder by pulling is notoriously well known as evidenced by Nelson *et al.* ('236) who teach a molding process including an inflatable bladder that is removed from the molded structure by pulling (see col. 3, lines 15-23). Therefore, it would have been obvious for one of ordinary skill in the art to remove the inflatable bladder by pulling as taught by Nelson *et al.* ('236) in the process of Freeman ('771) in view of Robin *et al.*

(‘831) and in further view of Mittelstadt *et al.* (‘976) and Azzani *et al.* (‘514) because of known advantages such as reduced weight and simplicity and also because, Freeman (‘771) specifically teaches the ability to remove the inflatable plastic bladder, hence suggesting the process of Nelson *et al.* (‘236). Further, it is noted that in order to pull the bladder of Freeman (‘771) in view of Robin *et al.* (‘831) and in further view of Mittelstadt *et al.* (‘976), Azzani *et al.* (‘514) and Nelson *et al.* (‘236), it is submitted that the bladder extends out of the mold.

Further regarding claim 8, Freeman (‘771) in view of Robin *et al.* (‘831) and in further view of Mittelstadt *et al.* (‘976), Azzani *et al.* (‘514) and Nelson *et al.* (‘236) do not teach trimming the molded composite structure. However, trimming of a molded structure is well known. It would have been obvious for one of ordinary skill in the art to have trimmed the molded composite structure obtained by the process of Freeman (‘771) in view of Robin *et al.* (‘831) and in further view of Mittelstadt *et al.* (‘976), Azzani *et al.* (‘514) and Nelson *et al.* (‘236) because of known advantages such as improved aesthetics and reduced costs by reducing the complexity of mold design and allowing for some scrap to form.

Regarding claims 2 and 12, Freeman (‘771) teaches a glass fiber preform and a thermosetting resin (see col. 2, line 21 and col. 3, lines 1-5). It is noted that it is well known that epoxy is a thermosetting resin used in making fiber reinforced composite structures as evidenced by Robin *et al.* (‘831) who teaches an epoxy resin (see col. 3, lines 50-55). Therefore, it would have been obvious for one of ordinary skill in the art to have used an epoxy resin as taught by Robin *et al.* (‘831) as the thermosetting resin in the process of Freeman (‘771) in view of Mittelstadt *et al.* (‘976) and in further view of Azzani *et al.* (‘514) and Nelson *et al.* (‘236)

because of known advantages that epoxy provides such as increased chemical and mechanical characteristics, ease of processability, its well known status as a thermosetting resin used in making fiber reinforced composite structures and also because, Freeman ('771) specifically teaches a thermosetting resin, hence suggesting the epoxy resin of Robin *et al.* ('831).

In regard to claims 11 and 19, Freeman ('771) teaches pressurizing said inflatable plastic bladder (40) (plastic tube) to force said fiber material (38) against said lower and upper mold halves and maintaining pressure during the curing process (see col. 3, lines 1-10). Further, it is noted that pressure must be maintained during the curing process in order to avoid pore formation, hence in order for the invention of Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976), Azzani *et al.* ('514) and Nelson *et al.* ('236) to function as described.

Specifically regarding claims 3-7, 9-10 and 13-18, Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976), Azzani *et al.* ('514) and Nelson *et al.* ('236) do not teach a specific molding temperature, molding time, vacuum pressure and curing pressure. However, it is submitted that such parameters are result-effective variables that depend on the chosen resin as taught by Freeman ('771) (see col. 3, lines 1-10). Hence, it would have been obvious for one of ordinary skill in the art to have used routine experimentation in the process of Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976), Azzani *et al.* ('514) and Nelson *et al.* ('236) to determine optimum ranges for the molding temperature, molding time, vacuum pressure and curing pressure because it is known that such parameters are result-effective variables that depend on the type of resin being used. It

is noted that Azzani *et al.* ('514) teach a molding temperature of 80-200 °C, a molding pressure of 3 bars and a molding time varying from several minutes to several hours (see col. 6, lines 25-35).

Response to Arguments

4. Applicants' arguments filed January 8, 2007 have been considered.

5. In response to applicant's arguments against the teachings of Freeman ('771), Robin *et al.* ('831) and Mittelstadt *et al.* ('976) individually (see pages 8-9 of the amendment filed 1/8/2007), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981) and In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). It is noted that the test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art.

6. Applicants argue that the art of record does not teach or suggest either alone or in combination "laying up a plurality of layers of composite fabric within a mold and compacting each layer by applying vacuum" (see page 9 of the amendment filed 1/8/2007). However, as shown above, Mittelstadt *et al.* ('976) teach that it is conventional when building a fiber-reinforced composite in a mold to apply a plastic film and then vacuum each individual layer prior to applying an additional fiber composite layer (see col. 1, lines 23-44). Therefore, it would have been obvious for one of ordinary skill in the art to employ vacuum debulking as taught by Mittelstadt *et al.* ('976) in the process of Freeman ('771) in view of Robin *et al.* ('831) because

of known advantages such as reduced porosity, hence providing for an improved product and also because Freeman ('771) in view of Robin *et al.* ('831) teach manual debulking, hence suggesting the vacuum debulking process of Mittelstadt *et al.* ('976).

7. Applicants argue that the art of record does not teach or suggest either alone or in combination removing the bladder because "there is no teaching that there are access points to the bladder at corners of the mold" (see page 10 of the amendment filed 1/8/2007). In response it is noted that:

(a) The primary reference, Freeman ('771), teaches a process for making a tubular composite door including, providing a mold having a lower mold half (24) and an upper mold half (36) and, a plurality of corners (see the corners Figure 1), placing fiber material (38) onto said lower and upper mold halves, providing an inflatable plastic bladder (40) (plastic tube) that is *formed from a plurality of bladders* (plastic tubes) and the *ability to remove the inflatable plastic bladder* (40) (plastic tube) (emphasis added) from the resulting molded structure (see col. 3, lines 6-10).

(b) The secondary reference, Nelson *et al.* ('236), teaches a molding process including an inflatable bladder that is removed from the molded structure by pulling (see col. 3, lines 15-23).

Therefore, it would have been obvious for one of ordinary skill in the art to remove the inflatable bladder by pulling as taught by Nelson *et al.* ('236) in the process of Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976) and Azzani *et al.* ('514) because of known advantages such as reduced weight and simplicity and also because,

Freeman ('771) specifically teaches the ability to remove the inflatable plastic bladder, hence suggesting the process of Nelson *et al.* ('236).

Also, it is noted that, "[i]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." See MPEP §2144.01, citing, In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968). That is, in order to pull the bladder of Freeman ('771) in view of Robin *et al.* ('831) and in further view of Mittelstadt *et al.* ('976), Azzani *et al.* ('514) and Nelson *et al.* ('236), it is submitted that the bladder extends out of the mold, hence that access points to reach the bladders are available.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 1732

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (571) 272-1208. The examiner can normally be reached on Monday-Friday 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson, can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stefan Staicovici, PhD



Primary Examiner

2/8/07

AU 1732

February 8, 2007